DOCUMENT RESUME

ED 232 913 SO 014 793

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TITLE Microcomputer Software and the Social Studies. ERIC Fact Sheet No. 7.
INSTITUTION ERIC Clearinghouse for Social Studies/Social Science Education, Boulder, Colo.
PUB DATE Dec 82
NOTE 4p.
PUB TYPE Information Analyses - ERIC Information Analysis Products (071)

EDRS PRICE MF01/PC01 Plus Postage.
DESCRIPTORS Annotated Bibliographies; *Computer Assisted Instruction; Computer Literacy; *Computer Programs; Databases; Elementary Secondary Education; *Evaluation Criteria; Instructional Innovation; *Microcomputers; Program Evaluation; Research Needs; *Social Studies; Teaching Methods
IDENTIFIERS Computer Uses in Education; Fact Sheets; PF Project

ABSTRACT

The paper focuses on questions related to the use of microcomputer software in the social studies classroom. The most commonly used microcomputer instructional techniques are presented, including drill and practice, tutorial, inquiry learning, educational games, real world simulations, models, use of graphics, and creative writing. The paper addresses major advantages of microcomputer instruction in implementing particular instructional strategies (such as the use of totally objective and immediate feedback) and accommodating a wide variety of learning styles. The limited research concerning computer assisted instruction, the limited availability of social studies software, and possible reasons for the reluctance of software producers to invest in high quality, educationally sound software for the school market are discussed. Instruments available for assessing the soundness of microcomputer programs and additional sources of evaluative information are included. A brief discussion of major issues concerned with incorporating software in the classroom is followed by a 7-item annotated bibliography of resources in the ERIC system on microcomputers for the social studies. (LH)

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MICROCOMPUTER SOFTWARE AND THE SOCIAL STUDIES

AN ERIC FACT SHEET NO. 7

Dec 82

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SP 014 793

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FACT SHEET NO. 7
December 1982

Microcomputer Software and the Social Studies

Proponents of microcomputers have high hopes for the role this new technology will play in shaping the schools of the future. They predict that in time, microcomputers will bring about major changes, ranging from more efficient and creative instruction to a revolution in school organization.

While these predictions offer exciting possibilities, social studies educators, like other subject-area specialists, are concerned about what microcomputers can do *today*. They realize that computers can only be useful instructional tools if quality software is available. Hence, they are asking such questions as: What world history simulation programs are available for the TRS-80? Has "Oregon Trail" been evaluated? What vendor produces software for secondary economics courses? This fact sheet provides general information to help educators find the answers to these and other questions related to the use of microcomputer software in the classroom.

What kinds of instruction can microcomputers provide?

Programs use a variety of techniques and combinations of techniques to instruct students in social studies — or any other subject area. Eight of the most commonly used techniques are:

— Drill and practice. The computer presents exercises to help students review such previously studied material as state capitals and historical dates. The computer asks a question, the student answers, and the computer immediately evaluates the response. Some programs also give feedback about the student's overall performance.

— Tutorial. The computer uses a variety of instructional processes (introduction of new material, drill/practice, performance monitoring, remediation, providing feedback) to tutor students in new concepts and skills.

— Inquiry. Students explore concepts through a question-and-answer dialog in which the computer responds to the student's natural language comments.

— Educational Games. The computer places students in a competitive situation with a set of rules. Through scoring points so that they either win or lose, students develop concepts and skills, including general problem-solving skills.

— Simulation. The computer presents a model of a system in the real world, along with rules and resources that students use to predict and test the operation of the system. The experience enables students to study social conflict, historical events, and other "real world" systems.

— Models. Students develop their own models of systems and then test whether the models are appropriate. By observing the consequences of changing conditions and assumptions, students develop higher-level thinking skills.

— Use of graphics. The computer constructs a diagram on the terminal in steps, allowing students to acquire information.

— Creative writing. The students key in writing assignments, which they can then edit or correct, thereby improving their writing skills.

Teachers can use these same techniques without computers. What advantages does use of the microcomputer offer?

Certain characteristics of the computer make it nearly ideal for implementing particular instructional strategies. Dr. Robert B. Abelson, SSEC staff associate, has identified three general educational tasks for which microcomputers are especially well suited: (1) providing conditions known to facilitate learning (e.g., providing immediate feedback, breaking down complex tasks into easily mastered steps, perceptually organizing complex information through dynamic graphics), (2) providing conditions favorable to motivation (e.g., providing totally objective feedback not confounded by the teacher's mood or expectations or by the student's interpersonal patterns, continuously and automatically adjusting the difficulty of a lesson so that every student has a predominantly successful experience), and (3) providing efficient management of learning (e.g., personalizing the learning experience to accommodate a variety of learning styles, providing activities that investigate or use highly complex situations or material that would be difficult or impossible to use without a computer).

Does the research confirm the effectiveness of microcomputers in achieving student learning?

This critical question cannot be definitively answered. Researchers have investigated the use of software in individual courses, but the work has been on a small scale and has not focused on social studies. A fall 1980 review of research conducted at the Northwest Regional Educational Laboratory (ED 213 393) indicated that "Although the literature contains descriptions of CAI [computer-assisted instruction] simulations in various social studies courses, few research results are reported." The research across all subject areas indicated that CAI contributed to higher student achievement when it *supplemented* traditional instruction and that students had positive attitudes about classroom use of computers. Broader studies should be completed during the next few years, but they are unlikely to focus on social studies.

Is much social studies software available? Does it make full use of the instructional potential of microcomputers?

At least 95 percent of the large, computer-managed instructional packages available are mathematics programs, according to one of the first major reviews of educational software. The Education Products Information Exchange (EPIE) and the Microcomputer Resource Center at Teachers College examined six major curriculum packages from commercial publishers, a high percentage of the products that were available in spring 1981 when the study was conducted. The researchers found not only narrow subject area coverage, but limitations in terms of instructional techniques, objectives, and grade level as well. Most of the programs used drill-and-practice techniques, focusing on recall of facts; few taught concepts or higher-order thinking skills. Graphics were rarely an integral part of instruction. Few packages were available for use in high school. For further information about the study, contact Vicki L. Blum, 333 West 84th St., Apt. 3F, New York, NY 10024.

This fact sheet was prepared by Sheryl B. Robinson, Coordinator of User Services for ERIC/ChESS.

Why isn't there an abundance of quality software?

Two reasons are commonly given. First, much software is developed by computer vendors, programmers who use personal computers to supplement their incomes, and teachers. The first two groups have little understanding of sound educational practice, while the third has little programming experience. Second, producers are hesitant to take the financial risks associated with developing high-quality, educationally sound software. A great deal of borrowed time and money are needed to develop even the simplest drill-and-practice program. Given that producers see schools as a less-lucrative market than businesses or homes — after all, teachers are often reluctant to use microcomputers and school budgets are shrinking — they are reluctant to invest the necessary time and money to develop topnotch instructional programs.

How can I assess whether a program is sound?

Two instruments for evaluating educational software are available through the ERIC system. The summer 1981 issue of *School Microware Reviews* (ED 213 389), published by Dresden Associates, includes an evaluation form used by educators who review programs for that journal. The one-page form calls for a description of the program's goals and components and ratings of the program along three dimensions: instructions given to the user by the program, student-computer dialog, and miscellaneous concerns (e.g., "bugs" in the program). The *Evaluator's Guide for Microcomputer-Based Instructional Packages* (ED 206 330), developed by the MicroSIFT Clearinghouse at the Northwest Regional Educational Laboratory, contains a "Courseware Description" form and a "Courseware Evaluation" form. The first asks for a description of the software in terms of program format, instructional purpose and techniques, type of package, available documentation, and hardware needed for operation. The second requires the reviewer to examine the content, instructional quality, and technical quality of the program.

A third instrument developed by EPIE and the Microcomputer Resource Center calls for analysis of software in terms of the developer's rationale, educational objectives, content, instructional strategies, methodology for using the materials, and evaluation and testing components that are part of the software. Additional information about this instrument is available from EPIE, Box 620, Stony Brook, NY 11790.

Unfortunately, few vendors are willing to provide examination copies of programs due to copyright concerns.

If I can't review programs myself, where can I get evaluative information on available social studies software?

Two computerized data bases focus exclusively on computer education. RICE (Resources in Computer Education) contains two files of information. The software package file describes 2000 pieces of software in terms of cost, producer, subject area, grade/ability level, ERIC descriptors, instructional purpose, required hardware and software, instructional techniques, documentation available, and evaluation information. The second RICE file contains information about more than 150 producers of software: address, hardware brands and types for which software is produced, subject or application area for which software is produced, age levels, and modes of instruction. Three new files planned for addition to RICE in 1983 will focus on objectives and test items for computer education, school projects in K-12 computer applications, and statistical data on hardware in the schools. For more information about RICE, contact the Northwest Regional Educational Laboratory, 300 S.W. Sixth Ave., Portland, OR 97204.

Microcomputer Index is a quarterly publication that can now be accessed by computer. It is a subject index covering more than 2000 articles regarding microcomputers, many related to education. *Microcomputer Index* is published by Microcomputer Information Services, 2464 El Camino Real, Suite 247, Santa Clara, CA 95051. Both RICE and *Microcomputer Index* can be searched by ERIC/ChESS User Services.

What other issues do teachers who plan to use microcomputers need to think about?

Teachers need to consider at least four issues in addition to what software to use. First, they must concern themselves with training; teachers and students alike need enough skill with the computer to use instructional programs effectively. Classroom management must also be considered. If 30 students are to use one or two terminals successfully, major changes in physical arrangements and the organization of instruction may be required. Third, teachers must make a range of curriculum decisions. They must assess the individual needs of their students and determine how they can best use the microcomputer to meet those needs. Some students may profit most when the microcomputer is used to reinforce previous factual learning, while for others, programs to teach higher-order thinking skills may be most appropriate. Finally, educators cannot ignore a philosophical issue. When students use a microcomputer, they interact primarily with a machine, rather than with each other. Teachers in all subject areas — but particularly in social studies, where teaching the social skills needed to interact effectively in the larger society is a goal — must decide if, when, and how often it is beneficial to replace social experiences with technological experiences.

What resources for using microcomputers in the classroom are available from ERIC?

ERIC contains hundreds of documents that discuss issues related to use of computers in education. The following resources were selected because they are of special interest to classroom teachers, particularly social studies teachers. Most, although not all, ERIC documents are available for viewing in microfiche at libraries that subscribe to the ERIC collection. Microfiche copies of most documents can also be purchased from the ERIC Document Reproduction Service (Box 190, Arlington, VA 22210). Paper copies of some documents can also be purchased from EDRS, while others are available from the original publisher. Check *Resources in Education* for ordering information.

ED 213 393. *Microcomputers in Today's Schools: An Administrator's Handbook* (Northwest Regional Educational Laboratory, 1981). Contains journal articles, reports, and documents to inform administrators about computer applications in public schools.

ED 213 389. *School Microware Reviews. Evaluations of Educational Software for Apple, PET, TRS-80, with Index to Evaluations in Other Publications* (Dresden Associates, 1981). Reviews the operation and quality of 50 microcomputer software products for the elementary and secondary levels. Contains an evaluation instrument.

ED 209 165. *Computers in the Social Studies Classroom*, by Richard A. Diem (N C S S, 1981). Introduces social studies teachers to computers and their potential applications in schools. Discusses the origins of the modern computer, computer technology, computer hardware and software, and training teachers to use computers.

ED 207 526. *Proceedings of the National Education Computing Conference 1981* (NECC, 1981). Contains 50 conference papers on topics related to social science, computer literacy, simulations, preschool/elementary applications, and many others.

ED 206 330. *Evaluator's Guide for Microcomputer-Based Instructional Packages* (Northwest Regional Educational Laboratory, 1981). Introduces teachers and other educators to a four-stage process for evaluating software. Includes two evaluation instruments.

ED 200 449. *Early Adolescent Use of Selected Problem-Solving Skills Using Microcomputers*, by Dorothy Anna Howard Cox (1981). Investigates the effectiveness of microcomputer software programs in developing problem-solving skills in social studies, life science, and environmental science courses.

ED 196 431. *School Microware: A Directory of Educational Software* (Dresden Associates, 1980). Describes more than 500 programs in terms of name, department, subject, grade level, program type, purpose, required hardware, price, and ordering information.